



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/544,234	08/18/2006	Kozo Fujimoto	1076	2365
27649	7590	09/28/2007	EXAMINER	
MICHAEL TOBIAS 1629 K ST NW SUITE 300 WASHINGTON, DC 20006			SINGAL, ANKUSH K	
			ART UNIT	PAPER NUMBER
			2823	
			MAIL DATE	DELIVERY MODE
			09/28/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/544,234	Applicant(s) FUJIMOTO ET AL.	
	Examiner Ankush k. Singal	Art Unit 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 1-7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 August 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a) because they fail to show "...electrically conductive particles 3b..."(Para[0059],line 12-13) and "...an unillustrated spacer..."(Para[0063],line 5) as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR

1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as

"amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after

the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held

in abeyance.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 8,10-13 are rejected under 35 U.S.C. 102(b) as being anticipated by Segawa et al. (JP 2002-026070).

3. Re. claim 8, Segawa et al. discloses a method of interconnecting terminals characterized by including a terminal placement step of :

Placing terminals((22a,22b and 22c-22n) and (24a,24b and 24c—24n)) so as to oppose each other with an anisotropy electric conduction(same as anisotropic electrically conductive resin)(27) composition including at least electric conduction particles(same as electrically conductive particles) and a insulating resin(25)(same as resin component) which is not completely cured at the melting point of the electrically conductive particles(26a,26b,26c---26n) disposed between the opposing terminals(Figure 6, Para[0058]),

heating the resin composition to a temperature which is higher than the melting point of electric conduction particles(same as electrically conductive particles)(26a,26b,26c---26n) and at which the insulating resin(25)(same as resin component) is not completely

Art Unit: 2823

cured with the opposing terminals separated from each other by a space large enough to enable the particles to move laterally inside the space(Para[0067]) , wherein the heating, electrically conductive particles(26a,26b,26c---26n) collect between the opposing terminals((22a,22b and 22c-22n) and (24a,24b and 24c—24n)) by melting and agglomeration of the electrically conductive particles(26a,26b,26c---26n), and the opposing terminals are connected(Para[0064],line 8-10);and a resin component curing step of curing the resin component(Figure 7,Para[0037],line 1-7 and Para[0059]).

Re. claim 10, Segawa et al. discloses a method of interconnect terminals including completely filling the space between members on which the terminals ((22a,22b and 22c-22n) and (24a,24b and 24c—24n)) are provided with the resin composition(25 and 26a,26b,...26n)).



Re. claim 11, Segawa et al. discloses a method of mounting a semiconductor device comprising:

Art Unit: 2823

Including connection electrodes(same as electrode pads) (24a,24b and 24c—24n) of a chip(same as semiconductor chip)(24) opposite electrode(same as circuit electrode) (22a,22b and 22c-22n) provided on a substrate(same as circuit substrate)(21) so as to correspond to the connection electrodes(same as electrode pads) (24a,24b and 24c—24n) with an anisotropy electric conduction material(same as anisotropic electrically conductive resin)(27) composition comprising at least electric conduction particles(same as electrically conductive particles) and a insulating resin(25)(same as resin component) there between (Figure 6,Para[0058]) which is not completely cured at the melting point of the electric conduction particles(same as electrically conductive particles)(26a,26b,26c---26n)(Para[0037],line 1-2) disposed between the opposing electrodes(same as electrode pads) (24a,24b and 24c—24n) and electrode(same as circuit electrode) (22a,22b and 22c-22n).

heating the resin composition to a temperature which is higher than the melting point of electric conduction particles(same as electrically conductive particles)(26a,26b,26c---26n) and at which the insulating resin(25)(same as resin component) is not completely cured with the opposing electrode pads and circuit electrodes separated from each other by a space large enough to enable the particles to move laterally inside the space(Para[0067]) , wherein the heating, electrically conductive particles(26a,26b,26c---26n) collect between the opposing terminals((22a,22b and 22c-22n) and (24a,24b and 24c—24n)) by melting and agglomeration of the electrically conductive particles(26a,26b,26c---26n), and the opposing terminals are connected(Para[0064],line

Art Unit: 2823

8-10); and a resin component curing step of curing the resin component(Figure 7, Para[0037], line 1-7 and Para[0059]).

Re. claim 12, Segawa et al. discloses a method of interconnect terminals including completely filling the space between IC chip(same as semiconductor chip) and substrate(same as circuit substrate) are provided with the resin composition(25 and 26a,26b,...26n)).

v



Re. claim 13 as discussed above in claim 12, Segawa et al. discloses all the limitations as discussed above in claim 12 including during heating, substantially all of electrically conductive particles in the resin composition collect in regions between opposing electrode pads and circuit electrodes(as shown in the figure above , shown in figure 12).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Art Unit: 2823

Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Segawa et al. (JP 2002-026070) in view of Ouchi et al. (JP 2002-343829).

Art Unit: 2823

Re claim 9, Segawa et al. teaches all the limitations except the resin having reducing properties which reduce at least one of the surface of the terminals and the surface of the electrically conductive particles.

However, Ouchi et al teaches the limitations not taught by Segawa et al.

A method of joining(same as interconnect) terminals also characterizes:

A resist component is a thermosetting resin(same as resin) having reducing properties which reduce at least one surface of the solder jointed side(same as terminal and the surface of the electrically conductive particles(Para [0036].

It would have been obvious for one with ordinary skill in the art at the time the invention was made to modify Segawa et al. in view of Ouchi et al. to have the resin having reducing properties which reduce at least one of the surface of the terminals and the surface of the electrically conductive particles to make the resin stable chemically and has sufficient electric insulation (Para[0036] and [0031],line 2-3).

Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Segawa et al. (JP 2002-026070).

Re. claim 14 as discussed above in claim 11, Segawa et al. discloses all the limitations as discussed above in claim 11 including performing the heating with the opposing electrode pads and circuit electrodes separated from each other but does not teach the separation distance which is at least a multiple of the diameter of the particles .

Art Unit: 2823

However Segawa et al. disclosure for given conditions of the claimed invention , the claim range is considered to be an obvious matter of finding an optimum workable range for some chosen design requirement utilizing Segawa et al. method.

Note that it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves routine skill in the art. In re Aller, 105 USPQ 233.

Any difference in the claimed invention and the prior art may be expected to result in some differences in properties. The issue is whether the properties differ to such an extent that the difference is really unexpected. In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Re. claim 15 as discussed above in claim 11, Segawa et al. discloses all the limitations as discussed above in claim 11 including performing the heating with the terminals separated from each other but does not teach but does not teach the separation distance which is at least a multiple of the diameter of the particles . However Segawa et al. disclosure for given conditions of the claimed invention , the claim range is considered to be an obvious matter of finding an optimum workable range for some chosen design requirement utilizing Segawa et al. method.

Art Unit: 2823

Note that it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves routine skill in the art. In re Aller, 105 USPQ 233.

Any difference in the claimed invention and the prior art may be expected to result in some differences in properties. The issue is whether the properties differ to such an extent that the difference is really unexpected. In re Merck & Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Response to Applicants Argument

In response to applicants argument " the electrically conductive particles are immobilized, they are unable to move inside the electrically conductive material during heating", the applicant does not mention in the claim, whether the conductive particles are mobile or immobile and so the claim can be examined with its broadest interpretation, and even though the opposing terminals are separated large enough there will still be movement of particles due to applying force on both sides of the terminals .

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Anisotropically conducting adhesive and process for producing an anisotropically conductive adhesive(US 5,891,366).

Electrically conductive adhesive sheet, circuit board and electrical connection structure using the same(US 4,735,847).

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ankush k. Singal whose telephone number is 5712701204. The examiner can normally be reached on monday-friday 7am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MATTHEW SMITH can be reached on (571)272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2823

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ankush Singal



MICHELLE ESTRADA
PRIMARY EXAMINER